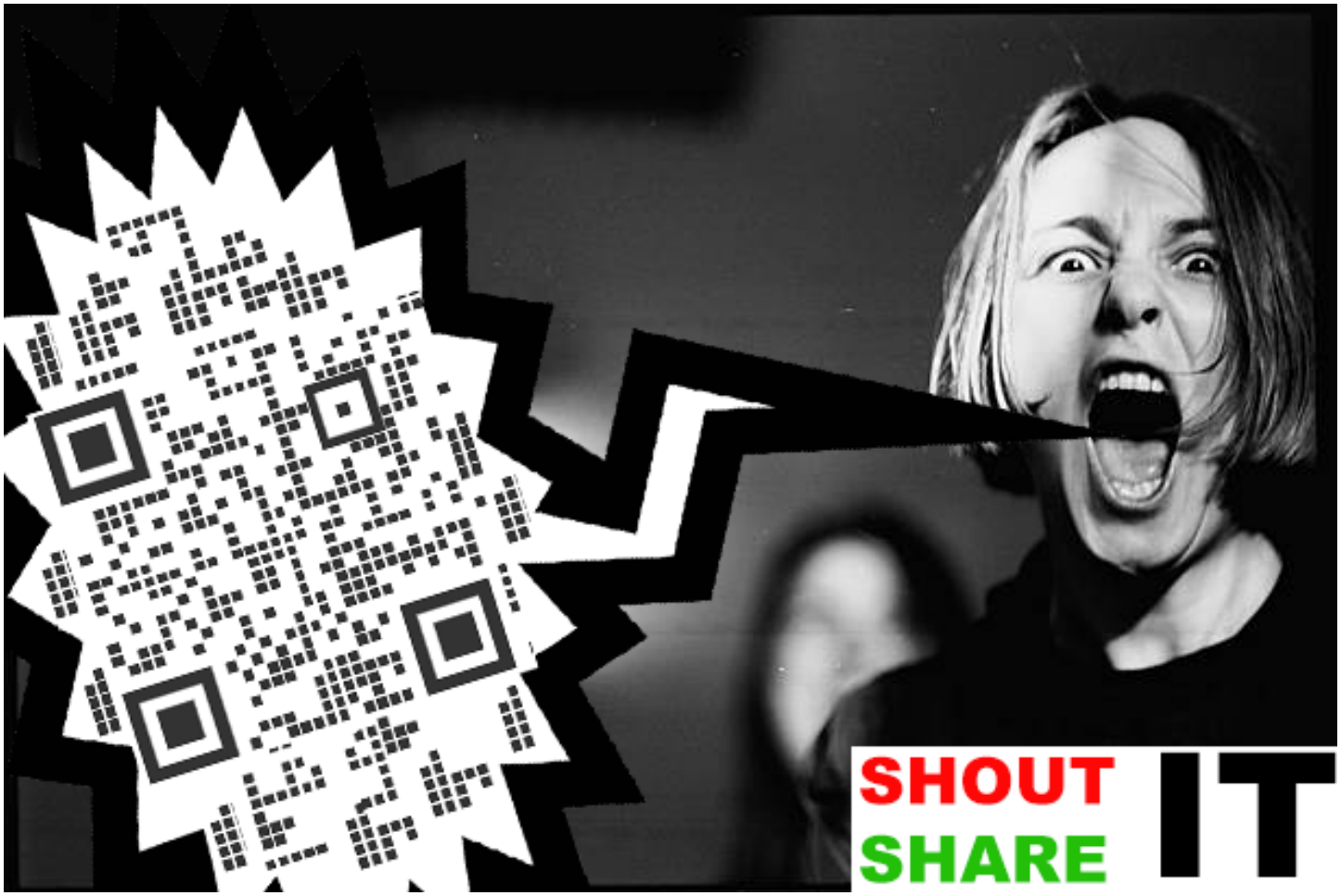
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(See page 73)

Young apples, showing open calyx end on right and closed calyx end in middle. (Slightly enlarged.)

INSECT RECORD FOR 1902

BY CLARENCE M. WEED

NEW HAMPSHIRE COLLEGE

AGRICULTURAL EXPERIMENT STATION

DURHAM

Bulletin 102 **May, 1903**

NEW HAMPSHIRE COLLEGE

OF

AGRICULTURE AND THE MECHANIC ARTS

AGRICULTURAL EXPERIMENT STATION

DURHAM, N. H.

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THE INSECT RECORD FOR 1902

BY CLARENCE M. WEED

For several years there has been reason to expect the advent of the SAN JOSÉ or PERNICIOUS SCALE[1] to our state, but I have been unable to find any trace of it until this season. The very fact that there are so few nurseries in the state rendered the finding of the pest more difficult, as well as made it more probable that it would be introduced without our knowledge. At present three infested localities are known, though it is probable that others exist. In the one first discovered on the outskirts of Manchester the insect was apparently introduced on a crab-apple tree set nearly eight years ago. In the same neighborhood the pest appears to have been re-introduced last spring on trees bought of a local agent who had purchased them outside the state. The next infestation to be found is at Dover Point, and originated from peach trees bought of a local greenhouse man who imports trees from outside the state. The third case is at Intervale, where the insect has been present for several years on some pear trees peculiarly sheltered by buildings.

The passage of a nursery inspection law by the legislature of 1903 will have a tendency to check the further introduction of this pest on nursery stock. No one should accept trees for planting which do not bear a certificate that they are free from insect pests.

I have been able to get no further evidence of the presence of the dreaded BROWN-TAIL MOTH[2] in this state. It has continued to increase to an alarming extent in Massachusetts, just south of our line, and is also reported as being present in

[1] *Aspidiotus perniciosus* Comstock.
[2] *Euproctis chrysorrhœa* Linnæus.

Maine; its further appearance within our borders is doubtless only a question of time. It behooves the residents of southeastern New Hampshire to be constantly on guard against this pest. Any time in fall, winter, or spring when one can find upon a tree a curled leaf containing a host of tiny caterpillars, the significance of the fact should be fully realized. For it is probably a colony of these pestiferous insects; the leaf securely packed in a tight tin box, without air holes, should be sent to the station with a full statement regarding the finding of it. All others of the nests should be promptly burned.

The Gypsy Moth, also, we must always be on the watch for. It seems as yet not to have gotten a foothold in the state, but it is so abundant near us and there are so many possibilities of its introduction that constant vigilance against it is also necessary.

No further injury from the Elf-leaf Beetle[1] has been reported, although it is probable that the insect is still present where it first appeared at Conway Center. This is an insect which owners of elm trees should be always watching for, as it is important that measures for its eradication be taken when it first appears in a community.

Canker-worms continued to be locally destructive in many parts of the state. Our observations showed that the Spring Canker-worm[2] was much more abundant in Durham than the Fall Canker-worm. We made many observations upon the life-history of this insect which will be reported at an early date.

The small apple crop of 1901 and the large one of 1902 apparently combined to render the damage done by the Codling Moth[3] comparatively small. The wet weather helped to make the attack of the apple scab fungus unusually severe, but the fruit on the whole was surprisingly free from apple worms. The recent investigations of several entomologists have shown that the benefit of spraying with poisons against this insect depends very largely upon getting the particles of poison into the blossom end of the young apples when the

[1] *Galeruca xanthomelæna* Schrenck.
[2] *Paleacrita vernata* Peck.
[3] *Carpocapsa pomonella* Linnæus.

lobes of the calyx are wide open, as shown in the right hand apple of the picture on the title page. When the growth of the fruit has caused these lobes to close, as shown in the middle apple of the same picture, it is too late to spray to advantage. A rather coarse spray which shall drive the poison into these open lobes is also believed to be better than a fine misty one.

One of the most notable entomological events of the season of 1902 was the sudden and nearly complete disappearance of the BLACK SQUASH BUG[1]—a pest that was extraordinarily abundant in 1901. While cucurbitaceous plants of all sorts were attacked and to a great extent destroyed in the last-named year, in 1902 practically no damage appears to have been done in any part of the state, and the insects were very much less common than usual. Reports from other states indicate a similar disappearance over a wide territory.

We made a careful study of this squash bug in 1901, the more important results of which are recorded in Bulletin 89 of this station. We found the percentage of parasitism to be too small to account for the disappearance of the pest, and no other natural enemies are known to be efficient enough to explain the fact. The only satisfactory explanation that I can think of is that the insects were killed by the weather conditions in the winter of 1901–'02.

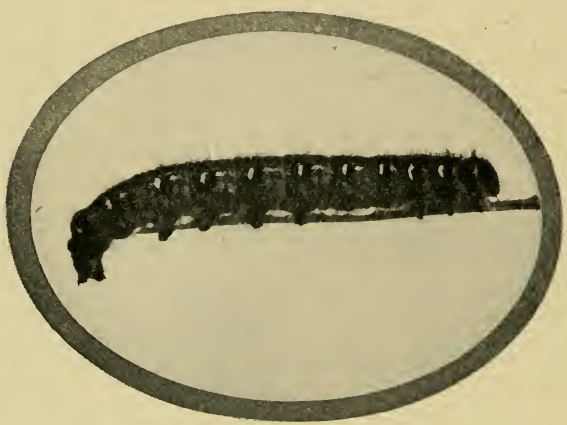
Another disappearance almost as marked as that of the Squash Bug, though less generally noticed on account of the small size of the insects, was that of the APPLE LEAF-HOPPER. As noted in the Record for that year, in 1901 this little insect was extraordinarily and destructively abundant, causing the leaves of whole apple orchards to appear spotted and sickly. In 1902, however, the Leaf-hopper did no noticeable damage.

No injury was reported from any part of the state as done by the FOREST TENT CATERPILLAR[2] or the SPINY ELM CATERPILLAR[3], these insects still remaining much below the normal limit in their numbers. The CHOKE-CHERRY TENT-MAKER[4] also continued much less abundant than usual, its conspicuous

[1] *Anasa tristis* De Geer.
[2] *Clisiocampa disstria* Harris.
[3] *Vanessa antiopa* Linnæus.
[4] *Cacœcia cerasivorana* Fitch.

nests being very rarely seen. Nor did we hear anything of the WHITE-WINGED BIBIO[1]—the fly that was reported in the Record for 1901 as having attracted so much attention.

The AMERICAN TENT CATERPILLAR[2] seems to be slowly increasing in numbers with each passing year. In 1901 the nests were noticeably more abundant than in 1900, while in 1902 I should say they were somewhat more numerous than in 1901. The work of birds, particularly the Baltimore Oriole



The American Tent Caterpillar.

and the Black-billed Cuckoo, in keeping them in check was quite noticeable. The easiest way to destroy these insects is to crush the caterpillars in the nest when it is small, or if it be on a little twig to cut it off and stamp it under foot.

The OYSTER-SHELL SCALE[3] still continues its attack upon the apple orchards of New Hampshire. While this insect is by no means so dangerous as the San José Scale, it has power to kill trees when unmolested and its presence should not be tolerated in a young orchard. Spraying with kerosene emulsion in June when the young lice are wandering as white specks over the bark will kill them; or some of the various winter washes used against the San José Scale may be applied.

[1] *Bibio albipennis* Say.
[2] *Clisiocampa americana* Harris.
[3] *Mytilaspis pomorum* Bouché.

During recent years the FALL WEBWORM[1] has been doing an increasing injury to a great variety of fruit and shade trees. This season the injury has been even greater than last, a great many trees having been entirely defoliated by the pest. The attack upon ash trees was especially severe.

During the last few years an increasing injury has been done by the WHITE FLY of greenhouses,[2] a tiny pest from a warmer climate. In the college greenhouses these insects have been destructive especially to crops of cucumbers and tomatoes. A series of experiments made by us during the summer showed that this insect may be controlled by the use of hydrocyanic acid gas. A detailed record of these experiments will be found in Bulletin 100.

Another pest which has been present in the state for several years, but has not heretofore been reported as doing serious damage is the PEAR-TREE PSYLLA.[3] Complaints of injury in pear orchards have been received during the summer from central New Hampshire.

The adult pear psylla is a small, jumping louse about one-tenth of an inch long. It has four nearly transparent wings, and is reddish, with transverse dark stripes on the abdomen. There are two distinct forms. The summer broods are much lighter in color than the brood which passes through the winter. This difference is so great that the two forms were considered distinct species until the life history was carefully worked out by Professor M. V. Slingerland.

The dark form passes through the winter in some sheltered situation about the tree, such as beneath loose bark or in the crevices between the branches. In early spring they come forth from their hiding places and deposit their eggs about the buds and on rough bark. These eggs are very small. When first deposited they are yellowish, but turn dark soon afterwards. The eggs hatch in three or four weeks, the time depending largely on weather conditions. The young psyllas, which during their immature stages are called nymphs, crawl to the stalks of the unfolding leaves, in which they insert their tiny

[1] *Hyphantria textor* Harris.
[2] *Aleurodes* sp.
[3] *Psylla pyricola* Foerst.

beaks to suck out the sap. They grow rapidly, occasionally molting or shedding their skins to provide for their increase in size, and in the course of a month become mature.

The first summer brood thus developed deposits eggs on the underside of the leaves. These eggs hatch ten days later, and mature in about three weeks. The insects of the second brood suck the sap from the leaves. There are several of these summer broods, the number varying with the locality and length of season. In early autumn the dark, hibernating winter form is developed.

The sap which passes through the bodies of these little creatures is ejected on the foliage, and forms the so-called "honeydew." Where the insects are very numerous this becomes very abundant, falling in showers when the branches are disturbed. After the honeydew has been present for some time a peculiar black fungus develops upon it, and gives the tree a sooty appearance.

Professor Slingerland makes the following statement concerning the indications of the presence of the pest: "Among

The Luna Moth (slightly reduced).

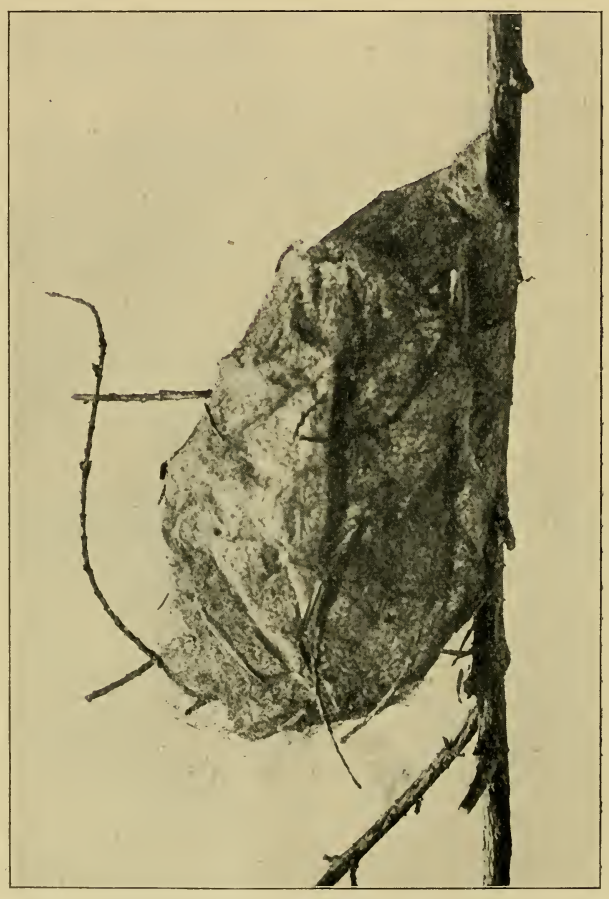
the first indications that pear growers, who suffered from this pest in 1891, had of its presence, was the noticeably lessened vitality of their trees early in the season. Old trees, especially, put forth but little new growth. Where new growth started, in many cases the shoots began to droop and wither in May, as if from a loss of sap. A little later whole trees put on a sickly appearance; the leaves turned yellow and the fruit grew but little. By midsummer nearly all the leaves and half-formed fruit fell from many trees."

This insect may be destroyed by spraying in spring, after the eggs hatch and before the first brood matures, with kerosene emulsion diluted with twenty-five parts of water. This is a simple and satisfactory remedy; if applied soon after a shower has washed off much of the honeydew, it is more effective.

Among the other insects reported as present in New Hampshire during the season, mention may be made of the following: The WHITE-MARKED TUSSOCK MOTH[1] continued present on the shade trees of towns and cities, having attracted especial attention in Nashua and Manchester. The cocoons of the CECROPIA EMPEROR MOTH,[2] one of which is illustrated herewith, were brought to my notice several times. This interesting insect is of special value for use in nature work in the schools. A brief account of its life-history will be found in Bulletin 59 of this station. The more beautiful LUNA MOTH[3] was also brought in as an adult several times. Its life-history is also discussed in the same bulletin. The IMPORTED CURRANT WORM[4] was about as destructive as usual, being easily held in check by spraying or dusting with poison. The presence of the FRUIT BARK-BEETLE[5] was noted in Nashua, its attack apparently being confined to a dead apple tree. The PLUM CURCULIO[6] was very injurious in plum orchards, although its injuries to apples were less in evidence than usual, presumably because of the abundant crop. Wireworms and cutworms of various species were also locally quite destructive.

[1] *Hemerocampa* (*Orgyia*) *leucostigma* Smith and Abbot.
[2] *Samia cecropia* Linnaeus. [3] *Tropoea luna* Linnaeus.
[4] *Nematus ribesii* Scopoli. [5] *Scolytus regulosus* Ratzeburg.
[6] *Conotrachelus nenuphar* Herbst.

The unusually wet season tended to diminish the injuries of such pests as grasshoppers, white-grubs, and aphides so that little, if any, complaint was heard about them. It is in dry seasons that the work of these insects is most likely to be in evidence.



Cocoon of Cecropia Moth. Large, loose form.

[Since the foregoing pages were written the Brown-tail Moth has been found in considerable numbers in Seabrook and Hampton. They were discovered in April, 1903.]

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